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**(12) United States Patent  
Fujii****(10) Patent No.: US 6,171,881 B1  
(45) Date of Patent: Jan. 9, 2001****(54) ACCELERATION SENSOR AND PROCESS  
FOR THE PRODUCTION THEREOF**

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**(\*) Notice:** Under 35 U.S.C. 154(b), the term of this patent shall be extended for 0 days.**(21) Appl. No.: 09/457,349****(22) Filed: Dec. 9, 1999****OTHER PUBLICATIONS****Related U.S. Application Data****(62)** Division of application No. 08/566,600, filed on Dec. 4, 1995, which is a continuation of application No. 08/167,976, filed on May 11, 1994, now abandoned.**(30) Foreign Application Priority Data**

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**(51) Int. Cl.<sup>7</sup> ..... H01L 21/00****(52) U.S. Cl. .... 438/52; 438/50; 257/415****(58) Field of Search .... 438/50, 52, 456,  
438/459; 257/415, 416, 417, 418, 419****(56) References Cited****U.S. PATENT DOCUMENTS**

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A single crystal silicon substrate (1) is bonded through an SiO<sub>2</sub> film (9) to a single crystal silicon substrate (8), and the single crystal silicon substrate (1) is made into a thin film. A cantilever (13) is formed on the single crystal silicon substrate (1), and the thickness of the cantilever (13) in a direction parallel to the surface of the single crystal silicon substrate (1) is made smaller, than the thickness of the cantilever in the direction of the depth of the single crystal silicon substrate (1), and movable in a direction parallel to the substrate surface. In addition, the surface of the cantilever (13) and the part of the single crystal silicon substrate (1), opposing the cantilever (13), are, respectively, coated with an SiO<sub>2</sub> film (5), so that an electrode short circuit is prevented in a capacity-type sensor. In addition, a signal-processing circuit (10) is formed on the single crystal silicon substrate (1), so that signal processing is performed as the cantilever (13) moves.

**13 Claims, 15 Drawing Sheets**